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EXAMINER	
THOMPSON, JAMES A	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/550,900	KAKUTANI, TOSHIAKI	
	Examiner	Art Unit	
	James A. Thompson	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *9/27/05, 3/19/07, 5/19/08, 9/22/08*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,11,12 and 14-29* is/are rejected.

7)☒ Claim(s) *6-10 and 13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 September 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/19/08, 9/22/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The Information Disclosure Statements (PTO-1449) filed 19 May 2008 and 22 September 2008 have been fully considered by Examiner. Copies of the documents have been signed, dated and initialed, and are included with the present action.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 23-25 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 23 recites an image output control program that is to be executed by a computer. Thus, while the program is intended to be executed by a computer, the program is a computer program listing *per se*, which is non-statutory. See MPEP § 2106.01(I). Claim 23 is not a process, machine, article of manufacture, or composition of matter, and is therefore not eligible for patent protection. Claims 24 and 25 each depend from claim 23 and are non-statutory for the reasons set forth for claim 23.

5. Claims 26 and 27 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 26 recites an image output control program that is to be executed by a computer. Thus, while the program is intended to be executed by a computer, the program is a computer program listing *per se*, which is non-statutory. See MPEP § 2106.01(I). Claim 26 is not a process, machine, article of manufacture, or composition of matter, and is therefore not eligible for patent protection. Claim 27 depends from claim 26 and is non-statutory for the reasons set forth for claim 26.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 15, 16, 18, 19, 21-24, 26, 27 and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Oyabu (US-4,837,846).

Regarding claims 15 and 29: Oyabu discloses an image processing device that causes input image data representing an image to go through a preset series of image processing and thereby generates control data, which is used for control of dot formation by an image output device that creates dots and outputs a resulting processed image **(fig. 9; column 2, lines 25-30 and lines 50-54 of Oyabu)**, said image processing device comprising:

a pixel group setting module that collects a predetermined number of plural pixels, among a large number of pixels constituting the image, to each pixel group **(column 4, lines 14-19 of Oyabu)**;

a dot number specification module that causes image data of respective pixels in each pixel group to be represented uniformly by preset representative image data and specifies number of dots to be created in each pixel group according to the representative image data **(column 4, lines 20-25 of Oyabu)**; and

a number data output module that outputs dot number data representing the specified number of dots with regard to each pixel group as the control data to said image output device **(column 4, lines 22-29 of Oyabu)**.

Further regarding claim 29: The image processing device of claim 29 is fully embodied by the image processing device of claim 15.

Regarding claims 18 and 23: Oyabu discloses an image output control method that makes image data subjected to a preset series of image processing and creates dots according to a result of the preset series of image processing to output an image **(column 2, lines 25-30 of Oyabu)** said image output control method comprising:

first step of collecting a predetermined number of plural pixels, among a large number of pixels constituting the image, to each pixel group **(column 4, lines 14-19 of Oyabu)**;

a second step of causing image data of respective pixels in each pixel group to be represented uniformly by preset representative image data and specifying number of dots to be created in each pixel group according to the representative image data **(column 4, lines 20-25 of Oyabu)**;

a third step of specifying a priority order of pixels for dot formation in each pixel group **(column 5, lines 29-2 of Oyabu)**;

a fourth step of determining position of each dot-on pixel included in each pixel group, based on the specified number of dots and the specified priority order **(column 5, lines 18-27 and lines 35-39 of Oyabu)**; and

a fifth step of actually creating a dot at the determined position of each dot-on pixel **(column 3, line 67 to column 4, line 2 of Oyabu)**.

Further regarding claim 23: Oyabu discloses that the method of claim 18 is performed *via* an image output control program that is executed by a computer **(column 4, lines 3-5 of Oyabu)**.

Regarding claims 21 and 26: Oyabu discloses an image processing method that causes input image data representing an image to go through a preset series of image processing and thereby generates control data, which is used for control of dot formation by an image output device that creates dots and outputs a resulting processed image **(column 2, lines 25-30 and lines 50-54 of Oyabu)**, said image processing method comprising the steps of:

(A) collecting a predetermined number of plural pixels, among a large number of pixels constituting the image, to each pixel group **(column 4, lines 14-19 of Oyabu)**;

(B) causing image data of respective pixels in each pixel group to be represented uniformly by preset representative image data and specifying number of dots to be created in each pixel group according to the representative image data **(column 4, lines 20-25 of Oyabu)**; and

(C) outputting dot number data representing the specified number of dots with regard to each pixel group as the control data to said image output device **(column 4, lines 22-29 of Oyabu)**.

Further regarding claim 26: Oyabu discloses that the method of claim 21 is performed *via* an image processing program that is executed by a computer **(column 4, lines 3-5 of Oyabu)**.

Regarding claims 16, 19, 22, 24 and 27: Oyabu discloses wherein said image processing device further comprises: a pixel number increase module that processes each original pixel of the image to generate multiple pixels having identical image data with image data of the original pixel, so as to increase a total number of pixels in the image, wherein said pixel group setting module collects the multiple pixels generated from an identical original pixel to one pixel group **(figs. 5-6; column 5, lines 59-67; and column 6, lines 52-56 of Oyabu)**.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

a. Determining the scope and contents of the prior art.

b. Ascertaining the differences between the prior art and the claims at issue.
c. Resolving the level of ordinary skill in the pertinent art.
d. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 1-5, 11, 12, 14, 17, 20, 25 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oyabu (US-4,837,846) in view of Sato (US-5,073,966).

Regarding claims 1 and 28: Oyabu discloses an image output control system **(fig. 9 of Oyabu)** comprising an image processing device that makes image data subjected to a preset series of image processing **(column 2, lines 25-30 of Oyabu)** and an image output device that creates dots according to a result of the preset series of image processing to output an image **(column 2, lines 50-54 of Oyabu)**,

said image processing device comprising:

a pixel group setting module that collects a predetermined number of plural pixels, among a large number of pixels constituting the image, to each pixel group **(column 4, lines 14-19 of Oyabu)**;

a dot number specification module that causes image data of respective pixels in each pixel group to be represented uniformly by preset representative image data and specifies number of dots to be created in each pixel group according to the representative image data **(column 4, lines 20-25 of Oyabu)**; and

a number data output module that outputs dot number data representing the specified number of dots with regard to each pixel group to said image output device **(column 4, lines 22-29 of Oyabu)**,

said image output device comprising:

a priority order specification module that specifies a priority order of pixels for dot formation in each pixel group **(column 5, lines 29-42 of Oyabu)**;

a pixel position determination module that determines position of each dot-on pixel included in each pixel group, based on the received dot number data and the specified priority order **(column 5, lines 18-27 and lines 35-39 of Oyabu)**; and

a dot formation module that actually creates a dot at the determined position of each dot-on pixel **(column 3, line 67 to column 4, line 2 of Oyabu)**.

Oyabu does not disclose expressly said image output device comprises a number data receiving module that receives the output dot number data with regard to each pixel group.

Sato discloses an image output device which comprises a number data receiving module that receives the output dot number data with regard to each pixel group **(fig. 8; and column 4, lines 13-18 and lines 33-45 of Sato)**.

Oyabu and Sato are analogous art because they are from the same field of endeavor, namely halftoning and digital image data processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have a separate output device which receives the output dot number data, as taught by Sato. The motivation for doing so would have been to reproduce high quality images with a minimum of overhead. Therefore, it would have been obvious to combine Sato with Oyabu to obtain the invention as specified in claims 1 and 28.

Further regarding claim 28: The system of claim 28 is fully embodied by the system of claim 1.

Regarding claim 2: Oyabu discloses wherein said image processing device further comprises: a pixel number increase module that processes each original pixel of the image to generate multiple pixels having identical image data with image data of the original pixel, so as to increase a total number of pixels in the image, wherein said pixel group setting module collects the multiple pixels generated from an identical original pixel to one pixel group **(figs. 5-6; column 5, lines 59-67; and column 6, lines 52-56 of Oyabu)**.

Regarding claim 3: Oyabu does not disclose expressly wherein said priority order specification module selects one priority order for each pixel group, among multiple priority orders prepared in advance.

Sato discloses wherein said priority order specification module selects one priority order for each pixel group, among multiple priority orders prepared in advance **(fig. 8 and column 4, lines 19-32 of Sato)**.

Oyabu and Sato are analogous art because they are from the same field of endeavor, namely halftoning and digital image data processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to select one priority order for each pixel group, among multiple priority orders prepared in advance, as taught by Sato. The motivation for doing so would have been to reproduce high quality images with a minimum of overhead by using multiple, selectable priority orders. Therefore, it would have been obvious to combine Sato with Oyabu to obtain the invention as specified in claim 3.

Regarding claims 4, 17, 20 and 25: Oyabu discloses said dot number specification module specifying the number of dots to be created in each pixel group, based on the

representative image data of the pixel group and the selected mapping **(column 5, lines 18-25 of Oyabu)**.

Oyabu does not disclose expressly wherein said dot number specification module comprises: a mapping storage module that stores multiple mappings for conversion of the representative image data of each pixel group into the number of dots to be created in the pixel group; and a mapping selection module that selects one mapping for each pixel group among the stored multiple mappings.

Sato discloses wherein said dot number specification module comprises: a mapping storage module that stores multiple mappings for conversion of the representative image data of each pixel group into the number of dots to be created in the pixel group **(fig. 8 and column 4, lines 19-32 of Sato)**; and a mapping selection module that selects one mapping for each pixel group among the stored multiple mappings **(column 4, lines 37-42 of Sato)**.

Oyabu and Sato are analogous art because they are from the same field of endeavor, namely halftoning and digital image data processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to perform the mapping taught by Sato. The motivation for doing so would have been to reproduce high quality images with a minimum of overhead by using multiple, selectable priority orders. Therefore, it would have been obvious to combine Sato with Oyabu to obtain the invention as specified in claims 4, 17, 20 and 25.

Regarding claim 5: Oyabu discloses wherein said mapping storage module stores multiple threshold value sequences, each consisting of plural threshold values corresponding to the predetermined number of plural pixels included in each pixel group, as the multiple mappings **(figs. 3 and 6; column 4, lines 16-19; and column 5, lines 59-64 of Oyabu)**,

said mapping selection module selects one threshold value sequence among the stored multiple threshold value sequences **(column 4, lines 16-19 and column 5, lines 59-64 of Oyabu** – *selects based on line image or halftone*), and

said dot number specification module sets number of smaller threshold values in the selected threshold value sequence that are smaller than the image data of each pixel group, to the number of dots to be created in the pixel group **(column 4, lines 39-43 and column 6, lines 7-11 of Oyabu)**.

Regarding claim 11: Oyabu does not disclose expressly wherein said mapping storage module stores a simplified dither matrix that includes the multiple threshold value sequences arranged in a preset two-dimensional array, as the multiple mappings, said mapping selection module selects one threshold value sequence corresponding to a position of each pixel group in the image, among the multiple threshold value sequences stored in the simplified dither matrix, and said dot number specification module specifies the number of dots to be created in each pixel group, based on comparison between the image data of the plural pixels included in the pixel group and the corresponding plural threshold values of the selected threshold value sequence.

Sato discloses wherein said mapping storage module stores a simplified dither matrix that includes the multiple threshold value sequences arranged in a preset two-dimensional array, as the multiple mappings **(figs. 7a-7b and column 3, lines 51-61 of Sato)**,

said mapping selection module selects one threshold value sequence corresponding to a position of each pixel group in the image, among the multiple threshold value sequences stored in the simplified dither matrix **(column 3, lines 55-57 of Sato)**, and

said dot number specification module specifies the number of dots to be created in each pixel group, based on comparison between the image data of the plural pixels included in the pixel group and the corresponding plural threshold values of the selected threshold value sequence **(column 4, lines 4-18 of Sato)**.

Oyabu and Sato are analogous art because they are from the same field of endeavor, namely halftoning and digital image data processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to perform the mapping and dot number specification taught by Sato. The motivation for doing so would have been to reproduce high quality images with a minimum of overhead by using multiple, selectable priority orders. Therefore, it would have been obvious to combine Sato with Oyabu to obtain the invention as specified in claim 11.

Regarding claim 12: Oyabu does not disclose expressly wherein said priority order specification module comprises: a priority order storage module that stores a priority order matrix including the multiple priority orders of pixels for dot formation in each pixel group in a preset two-dimensional array, and the simplified dither matrix and the priority order matrix have an identical number of rows and an identical number of columns expressed by the number of pixels.

Sato discloses wherein said priority order specification module comprises: a priority order storage module that stores a priority order matrix including the multiple priority orders of pixels for dot formation in each pixel group in a preset two-dimensional array **(fig. 8 and column 4, lines 25-32 of Sato** – *2-d array of dot priority matrices*), and

the simplified dither matrix and the priority order matrix have an identical number of rows and an identical number of columns expressed by the number of pixels **(figs. 7a and 8** - *both are size 4x8*).

Oyabu and Sato are analogous art because they are from the same field of endeavor, namely halftoning and digital image data processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to perform the mapping and dot number specification taught by Sato. The motivation for doing so would have been to use the priority order and simplified dither matrices taught by Sato. Therefore, it would have been obvious to combine Sato with Oyabu to obtain the invention as specified in claim 12.

Regarding claim 14: Oyabu discloses wherein said dot number specification module comprises: a dither matrix storage module that stores a dither matrix, which maps threshold values to respective pixels arranged in a two-dimensional array **(figs. 3 and 6; and column 4, lines 14-19 of Oyabu)**,

said dot number specification module compares the representative image data of each pixel group with a threshold value stored at a corresponding position in the dither matrix, so as to specify the number of dots to be created in the pixel group **(column 4, lines 20-27 of Oyabu)**,

said priority order specification module selects a set of plural threshold values stored at positions in the dither matrix corresponding to respective pixels of each pixel group as the priority order specified for the pixel group **(column 5, lines 29-37 of Oyabu)**, and

said pixel position determination module determines the position of each dot-on pixel, based on the dot number data and the selected set of plural threshold values **(column 5, lines 38-45 of Oyabu)**.

Allowable Subject Matter

10. Claims 6-10 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claim 6 recites that the mapping storage module stores the plural threshold values of each threshold value sequence together with information on an order of magnitude of the respective threshold values in the threshold value sequence, and the dot number specification module refers to the order of magnitude and compares the image data of each pixel group with the plural threshold values of the selected threshold value sequence, so as to specify the number of dots to be created in the pixel group. Examiner has not discovered this combination of features in the prior art. Accordingly, claim 6 is deemed to contain allowable subject matter.

Claims 7-10 each ultimately depend from claim 6, and therefore also contain allowable subject matter at least due to their respective dependencies.

Claim 13 recites wherein said mapping storage module stores the simplified dither matrix that is generated by dividing a dither matrix, which maps threshold values to respective pixels arranged in a two-dimensional array, into multiple groups corresponding to multiple pixel groups and includes the multiple threshold value sequences arranged corresponding to the multiple groups, and said priority order specification module comprises: a priority order storage module that stores a priority order matrix that is generated by dividing the dither matrix into the multiple

groups corresponding to the multiple pixel groups and includes the multiple priority orders arranged corresponding to the multiple groups, where the priority order is specified with regard to each pixel group based on a magnitude order of respective threshold values included in a corresponding group; and a priority order selection module that selects one priority order corresponding to a position of each pixel group in the image, among the multiple priority orders stored in the priority order matrix.

Examiner has not discovered this combination of features in the prior art. Accordingly, claim 13 is deemed to contain allowable subject matter.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Thompson whose telephone number is (571)272-7441. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward L. Coles can be reached on 571-272-7402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James A Thompson/
Primary Examiner, Art Unit 2625

27 September 2010